

Tropical forest monitoring with cloud-free image mosaics II

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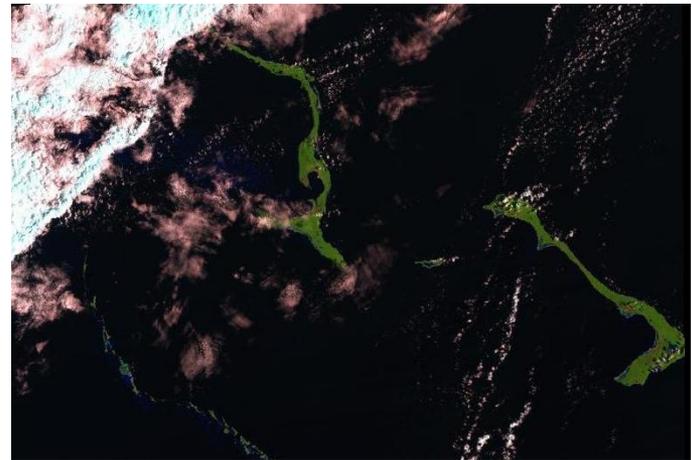
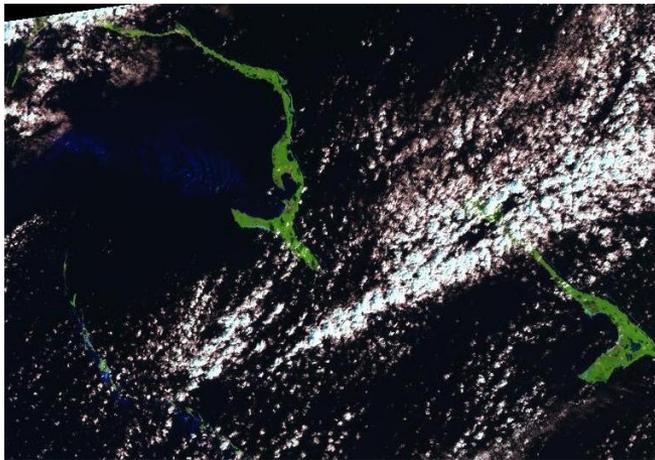
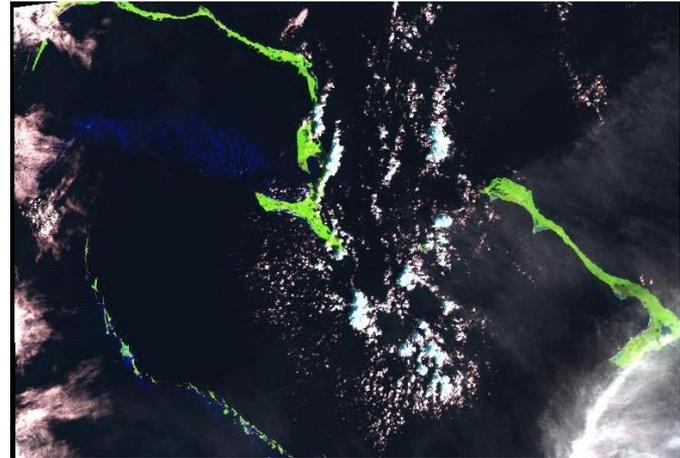
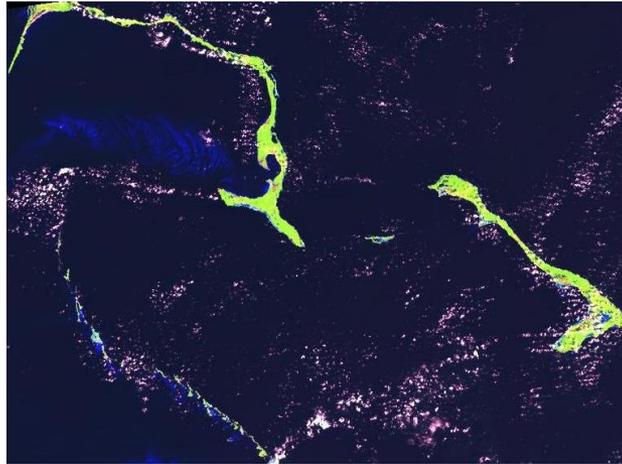


INTERNATIONAL INSTITUTE OF TROPICAL FORESTRY



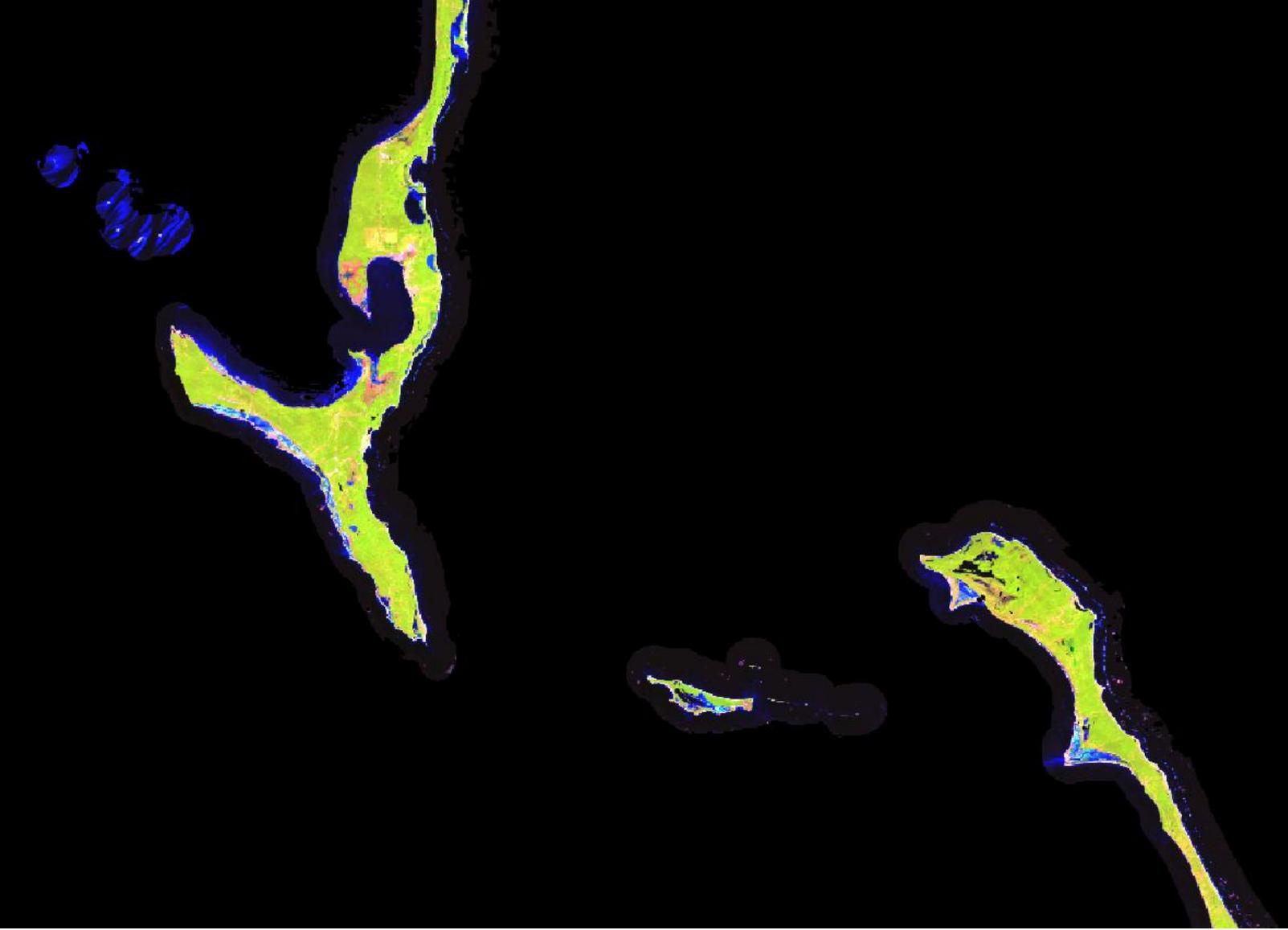
Colorado
State
University
Knowledge to Go Places

Cloud spatial patterns are irregular

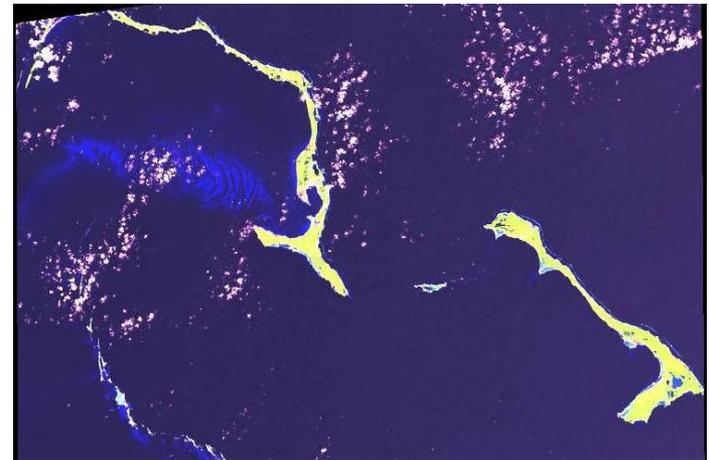
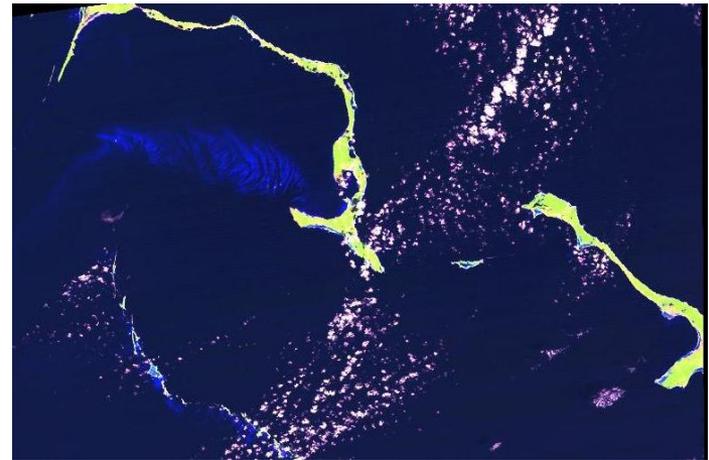
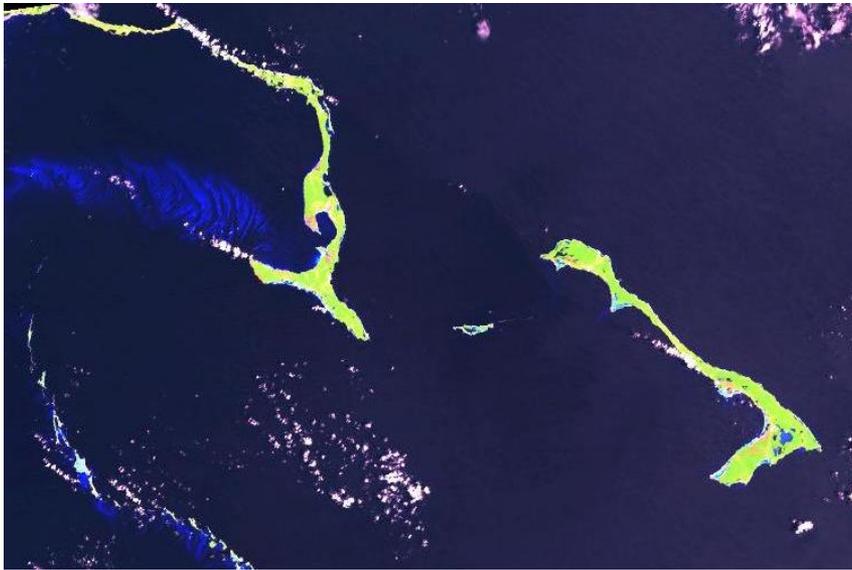


Eleuthera and Cat Islands, Bahamas – 1993-1994

1993-1994
mosaic from
regression
tree
normalization

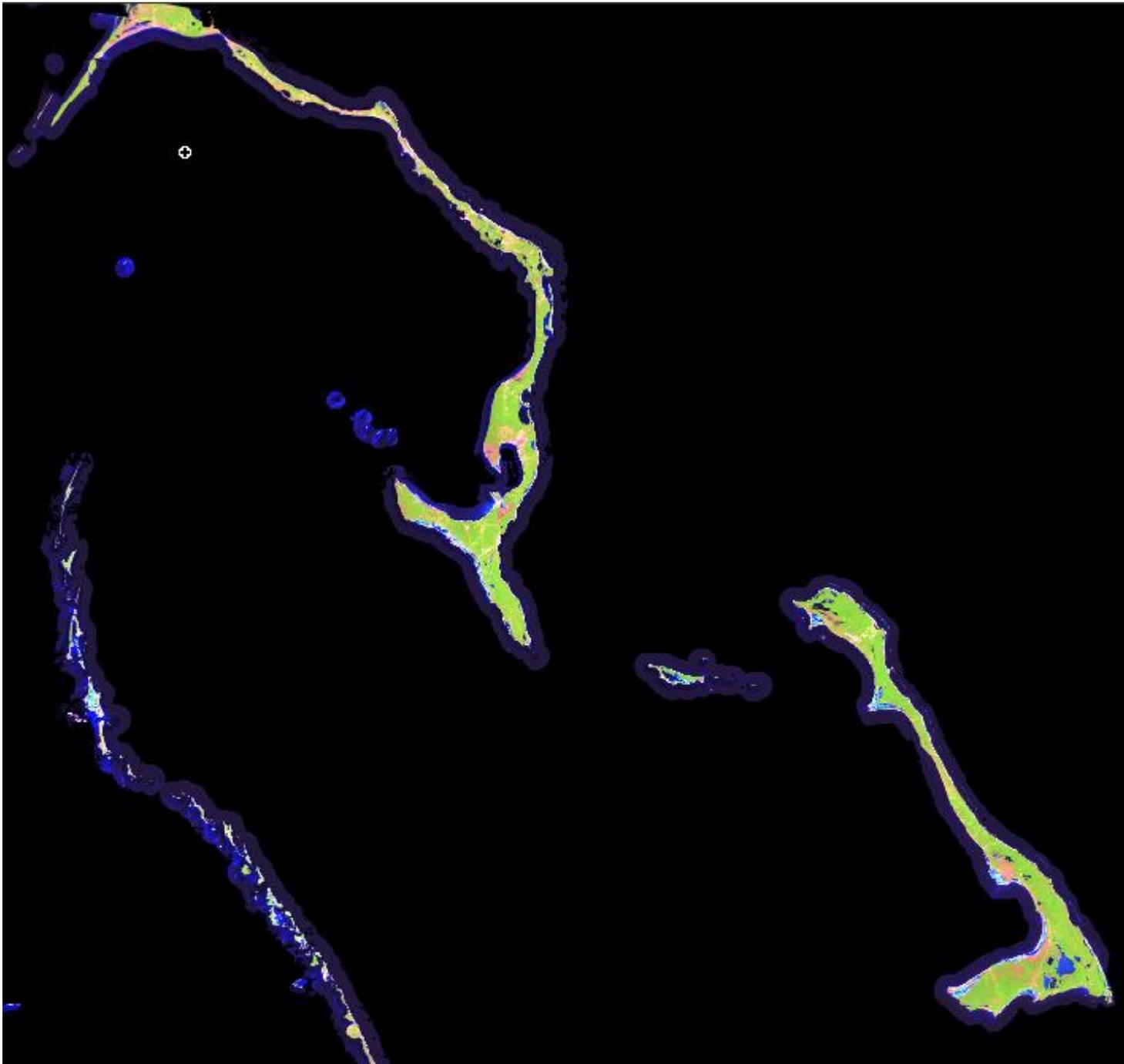


Filling cloud gaps with models that normalize inter-date differences with mutually clear pixels overcome the irregular cloud spatial patterns



Eleuthera and Cat Islands, Bahamas – 1999-2000

1999-2000
mosaic from
regression
tree
normalization



Helmer, EH and B Ruefenacht. 2007. *A comparison of radiometric normalization methods when filling cloud gaps in Landsat imagery.*
Canadian J. Remote Sensing: In Press

- Regression tree normalization more closely matches inter-date image differences than linear normalization, linear histogram matching or DOS atmospheric correction, because it most consistently matches areas of the most phenologically variable classes

Helmer, EH and B Ruefenacht. 2007. *A comparison of radiometric normalization methods when filling cloud gaps in Landsat imagery.*
Canadian J. Remote Sensing: In Press

- The main advantage of this success may be for visualization
- Observations:
 - *Best matches of scenes with similar sun angles*
 - *Slight cloud/shadow mask imperfections will not greatly degrade results*

Fruits are important to winter diet



Chiococca spp.



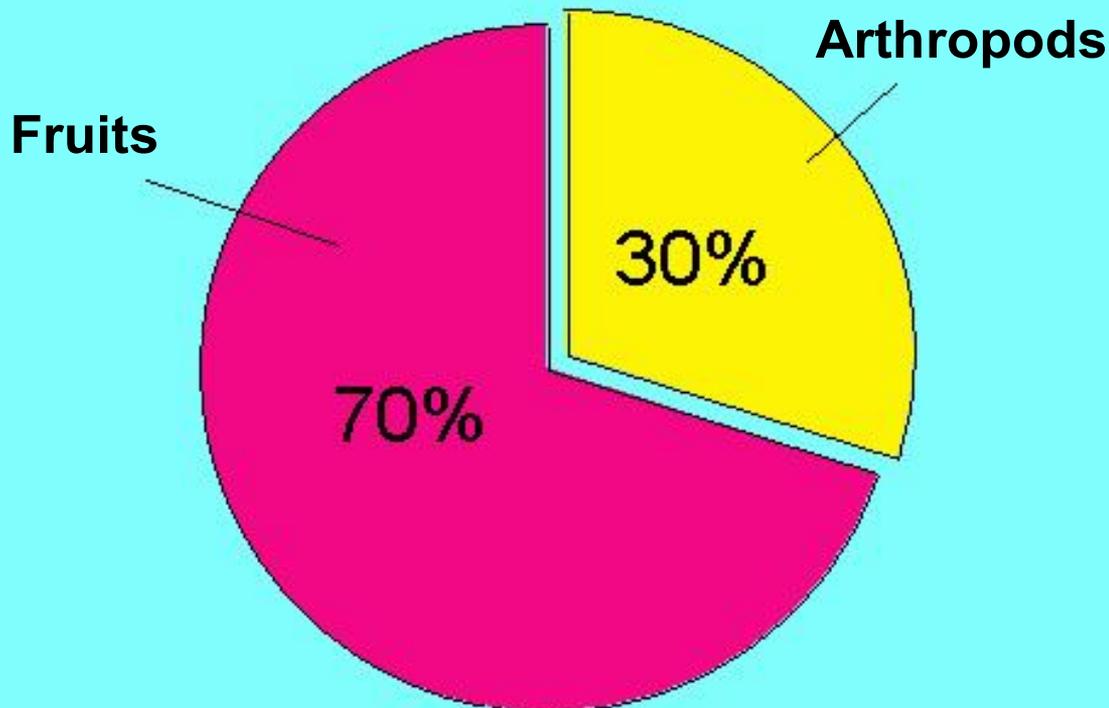
Erithalis spp.



Dave Currie



Lantana spp.



N= 422 observations

Different ages of forest:
-After bulldozing (greens)
-With goat grazing (blues)

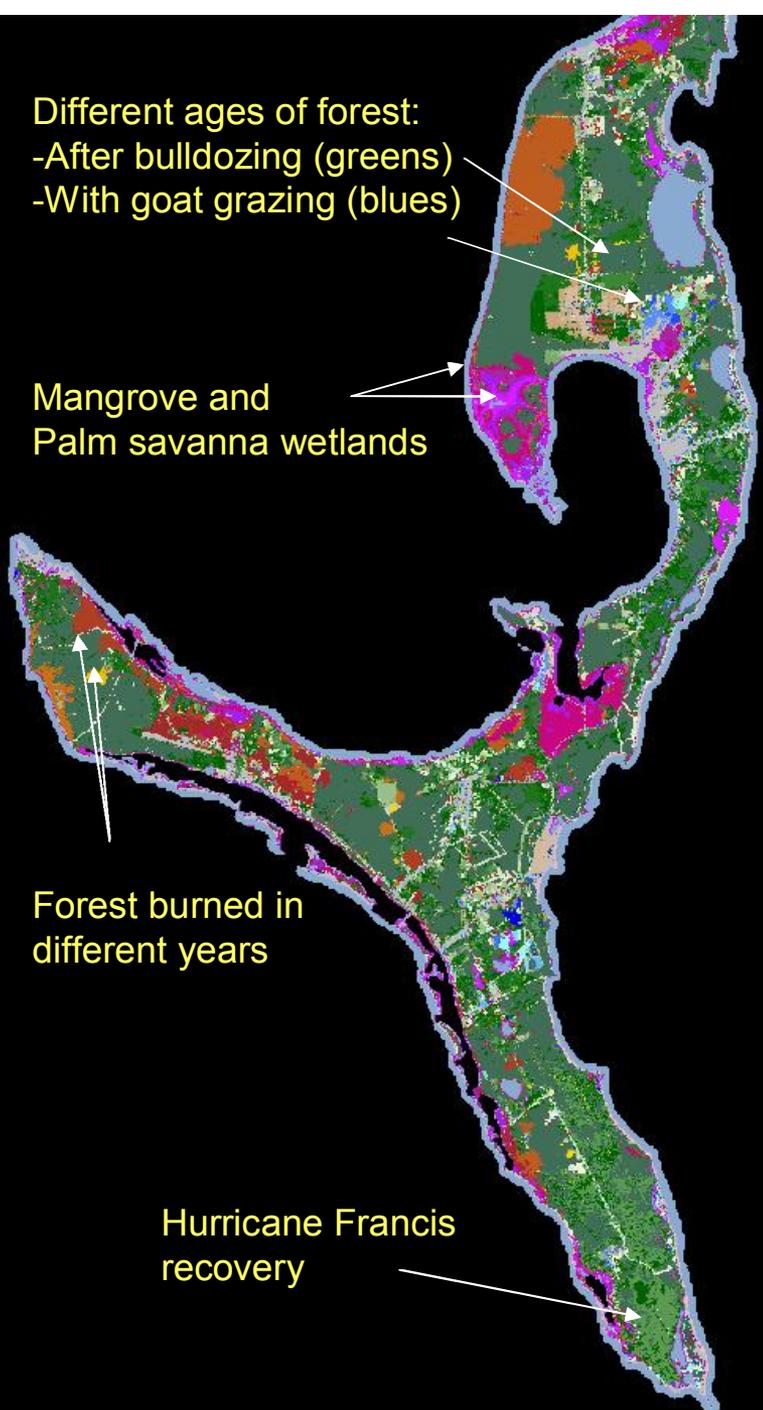
Mangrove and
Palm savanna wetlands

Forest burned in
different years

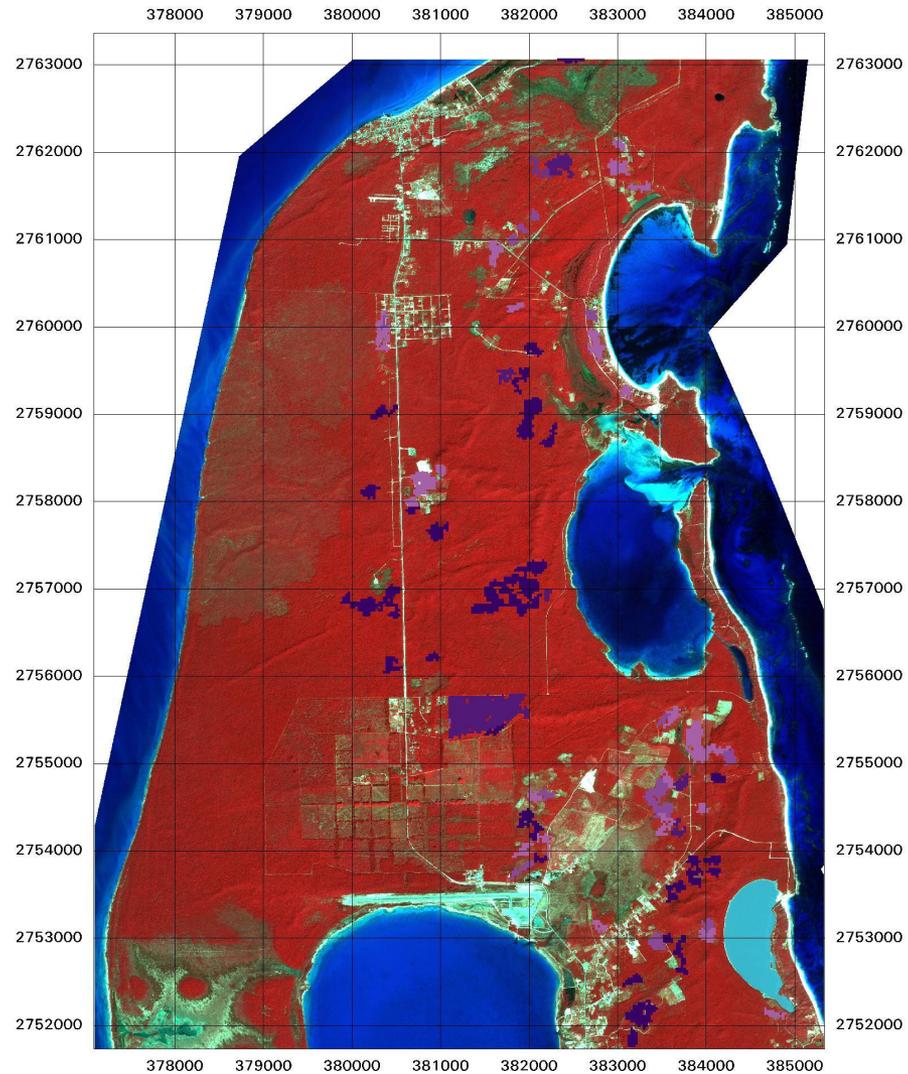
Hurricane Francis
recovery

Time series of cloud-free image mosaics based on regression tree normalization allows simultaneous mapping of forest age and disturbance history, as well as land-cover and forested wetland types

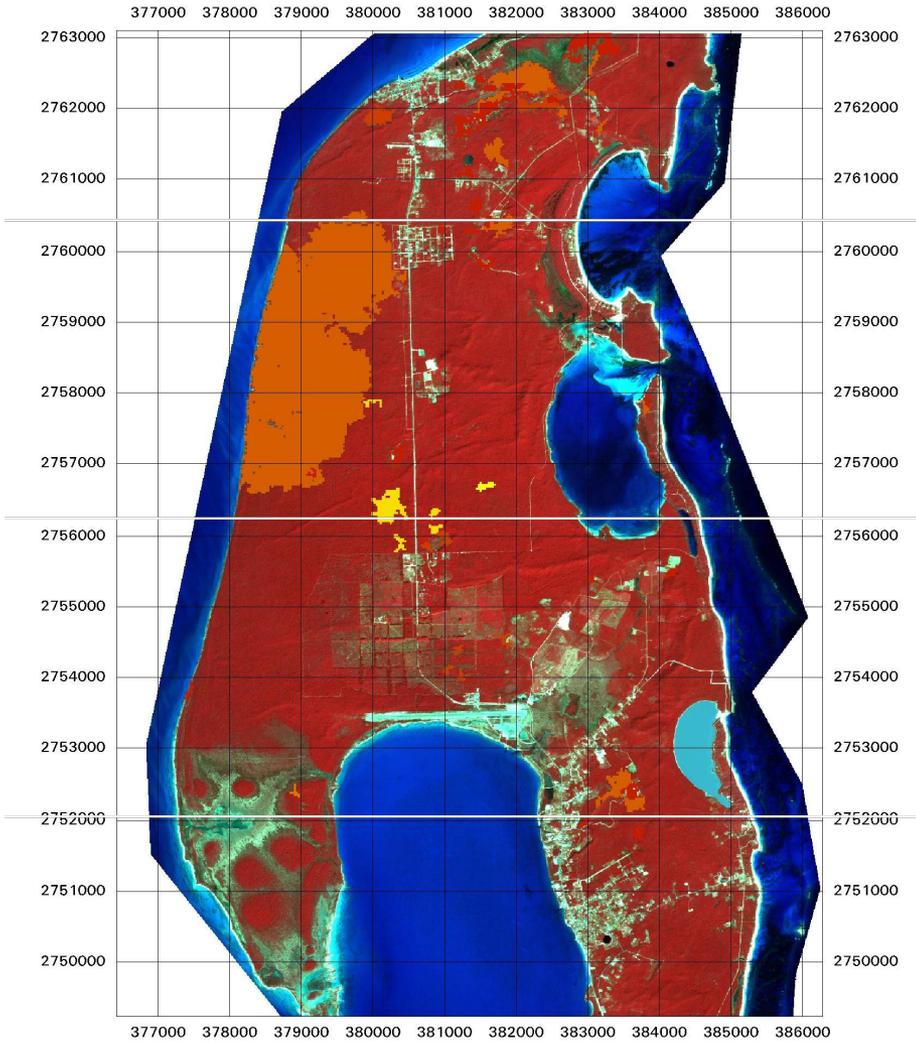
8 image/mosaic dates:
1984, 1988, 1993, 1996, 2000, 2001,
2003, 2005 (ALI)



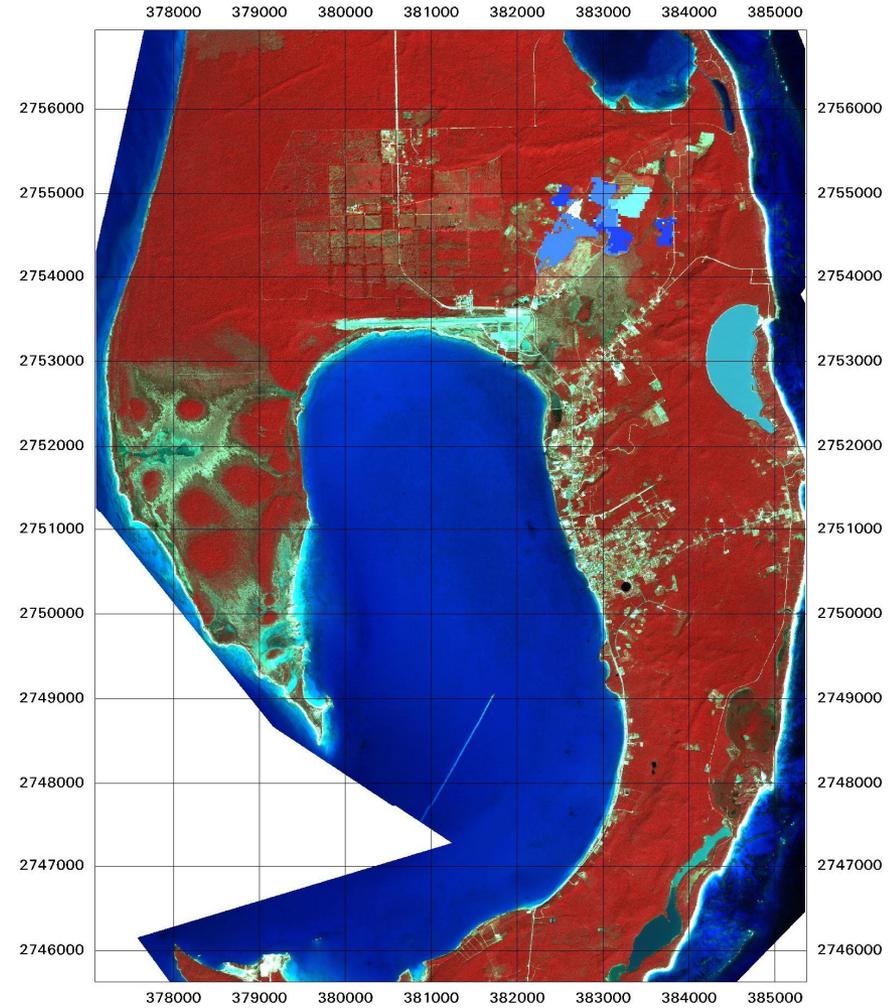
Patch-level random samples of secondary forest of different ages and disturbance types



Secondary forest of different ages following fire



Secondary forest of different ages subject to goat grazing



Kirtland's Warbler – Eleuthera

- March 2007
 - Validated forest disturbance types in type/age map
 - Measured structure and frequency of target plant species at ~50 plots in randomized patches of different forest ages and disturbance types

Kirtland's Warbler – Eleuthera

- Upcoming:
 - Patch-level community plant species composition Summer 2008
 - Classifications of mosaics with regression-tree normalization, atmospheric correction, or both
 - Disturbance rates
 - Vegetation age, disturbance type, structure and composition of Kirtland's Warbler capture sites and home ranges